



# **The Facts About Oral Disease in Michigan**

By  
Michael Paustian, MS  
June 7, 2005



## **Objectives**

- Oral health is integral to overall health
- Identify disparities in oral health
- Oral disease prevention
- Oral health workforce capacity
- Oral health infrastructure



## Early Childhood Caries - Basics

- Primary teeth affected by caries
- Causes
  - Inappropriate bottle use
  - Lack of early preventive care
  - Lack of parental education
- Outcomes
  - Hospitalization, multiple extractions
  - Future dental problems



## Early Childhood Caries - Risks

- Early preventive care in Michigan
  - 9% of 0-4 year old Medicaid children received any preventive service in 2002.
  - 20% of 0-4 year old children received any dental care in 2002.
- Inappropriate bottle use in Michigan
  - 29% of parents reported sending their child to bed with a liquid other than water in past month
  - 71% Hispanics vs. 23% Non-Hispanics



## Caries & Untreated Decay

- **Healthy People 2010: Objective 21-1:a-c.**
  - “Reduce the proportion of children and adolescents who have dental caries experience in their primary or permanent teeth”
  - Will be assessed in fall 2005
- **Healthy People 2010: Objective 21-2:a-d.**
  - “Reduce the proportion of children, adolescents, and adults with untreated dental decay”
  - Will be assessed in fall 2005



## Adult Tooth Loss – HP2010

- **Healthy People 2010: Objective 21-3**
  - “Increase the proportion of adults who have never had a permanent tooth extracted because of dental caries or periodontal disease”
  - Goal is 42% among adults age 35-44
- **Healthy People 2010: Objective 21-4**
  - Reduce the proportion of adults who have had all their natural teeth extracted
  - Goal is 20% among adults age 65-74



## Adult Tooth Loss, Michigan vs. National, BRFSS 2002

	Age 35-44 No Tooth Extractions		Age 65-74 Lost All Natural Teeth	
	Michigan (%)	United States (%)	Michigan (%)	United States (%)
<b>HP2010 Target</b>	42%	42%	20%	20%
<b>Total</b>	60%	39%	18%	25%
<b>By Race</b>				
<b>Black non-Hispanic</b>	36%	30%	DNA	34%
<b>White non-Hispanic</b>	65%	43%	13%	23%



## Adult Tooth Loss, Michigan vs. Detroit, BRFSS 1996-2002

	Age 35-44 No Tooth Extractions		Age 65-74 Lost All Natural Teeth	
	Michigan (%)	Detroit (%)	Michigan (%)	Detroit (%)
<b>HP2010 Target</b>	42%	42%	20%	20%
<b>Total</b>	59%	34%	20%	44%
<b>By Race</b>				
<b>Black non-Hispanic, Age 18-74</b>	41%	39%	10%	11%
<b>White non-Hispanic, Age 18-74</b>	56%	39%	6%	18%



## Periodontal Disease in Michigan

- Healthy People 2010 Objective 21-5:a-b.
  - “Reduce periodontal disease”
  - Age 35-44 Goal, Gingivitis 41%
  - Age 65-74 Goal, Destructive periodontal disease 14%
- Diabetics at increased risk
- Future population-based estimates will likely be available through BRFSS
- New areas of research
  - Oral piercings – lower lip studs
  - Preterm birth and low birth weight infants



## Oral Cancer

- Incidence comparable to cervical, stomach, and uterine cancer
- Modifiable risk factors
  - Tobacco use
  - Excessive alcohol intake
- Consequences
  - Survival decreases with stage at detection
  - Disfigurement, social implications

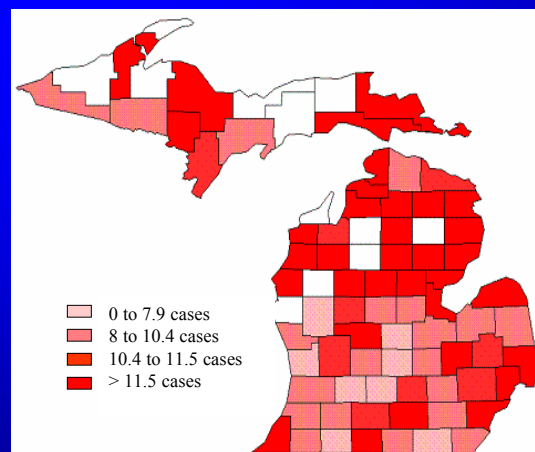


## Oral Cancer Incidence

- Age-adjusted incidence (rates per 100,000)
  - USA 2001, 10.4
  - Michigan 1991-2000, 11.5
- Michigan disparities
  - Males 2.6X higher than females (17.3 vs. 6.7)
  - African American males 1.5X higher than white males (25.0 vs. 16.2 )
  - Wayne county, 1.24X the state incidence rate (14.3 vs. 11.5)



## Age-adjusted Oral Cancer Incidence Rate (per 100,000) by County, 1991-2000.



\* Epidemiology of Oral Cancer in Michigan, 1991-2000

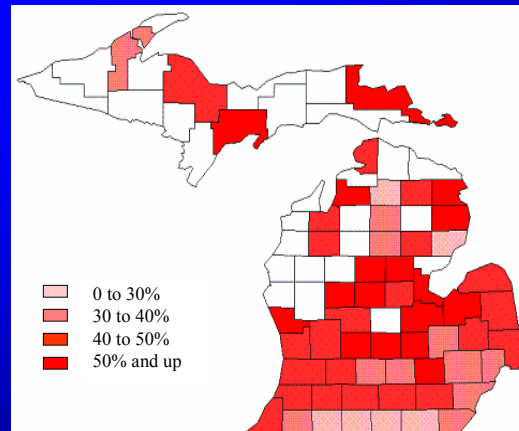


## Oral Cancer Detection & Survival

- Percentage of oral cancers detected at the earliest stage
  - USA 2003, 35%
  - Michigan 1992-94, 40.5%, Detroit 36.2%
  - Michigan 1997-99, 39.5%, Detroit 35.6%
- 5-year survival in Michigan
  - White males (52%)
  - Black males (30%)



## Percentage of Oral Cancers Detected at an Early Stage by County, 1997-1999



\* Epidemiology of Oral Cancer in Michigan, 1991-2000

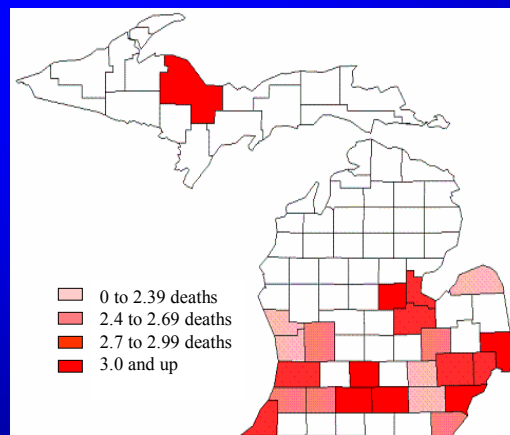


## Oral Cancer Mortality

- Age-adjusted mortality rates (per 100,000)
  - USA 1998, 3.0
  - Michigan 1991-2000, 2.9
- Oral cancer mortality disparities
  - Age-specific mortality was higher for males than for females (4.1 vs. 1.6)
  - African American mortality was 1.5X higher than for Whites (4.3 vs. 2.7)
  - Wayne and Jackson counties had mortality rates 1.28 times higher than the state (3.7 vs. 2.9)



## Age-adjusted Oral Cancer Mortality (per 100,000) by County, 1991-2000



\* Epidemiology of Oral Cancer in Michigan, 1991-2000





## Diabetes & Oral Health in Michigan

- Increased risk of periodontal disease
- Percentage of diabetics who have lost 6 or more teeth is declining
  - BRFSS 1996, 52%
  - BRFSS 2002, 45%
- Percentage of diabetics who visited the dentist in the past year is increasing
  - BRFSS 1996, 57%
  - BRFSS 2002, 70%



## Dental Needs Among Michigan CSHCN

- 2001 National Survey of CSHCN
  - In Michigan, 82.9% reported a dental need
  - 7.0% had unmet needs
- 2003 National Survey of Children's Health
  - 8.8% had unmet dental needs



## Economic Impact of Oral Disease

- **Medicaid expenditures**
  - USA 2003, \$74.3B, 4.4% of Medicaid
  - Michigan 2002, \$62.8M, 1.1% of Medicaid
- **Work hours & lost productivity**
  - 2.4 million work days nationally
- **School hours**
  - 1.6 million school days nationally



## Racial Disparities

- **African Americans**
  - More tooth loss
  - Fewer dental visits
  - Fewer sealants
  - Increased oral cancer incidence and mortality
- **Hispanics**
  - Inappropriate bottle use - ECC?
  - Fewer sealants



## Socioeconomic Disparities

- Nationally, low-income individuals are more likely to have...
  - Less dental visits
  - Higher caries rates and untreated decay
  - More periodontal disease
  - More tooth loss
- In Michigan, low-income individuals are...
  - Less likely to visit the dentist
  - More likely to have tooth loss



## Prevention of Oral Disease

- Preventive dental visits
- Community water fluoridation
- Sealant application
- Fluoride supplements
- Oral cancer screening
- Tobacco control
- Oral health education



## Dental Visits

- **Healthy People 2010 Objective 21-10**
  - “Increase the proportion of children and adults who use the oral health care system each year”
  - Goal, 56%
- **Healthy People 2010 Objective 21-12**
  - “Increase the proportion of low-income children and adolescents who received any preventive dental service during the past year”
  - Goal, 57%

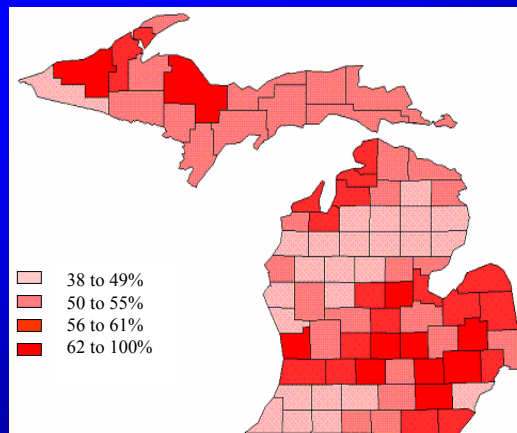


## Child Dental Visits

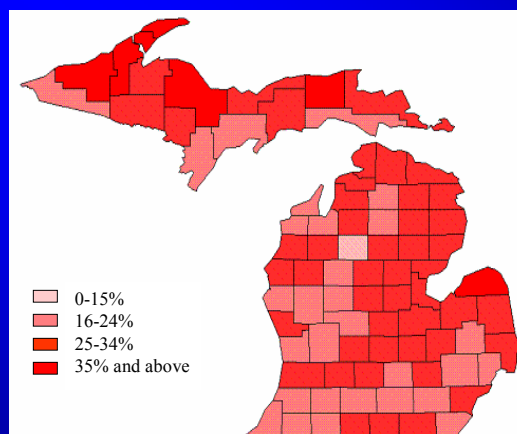
- **Children with any dental visit in 2002**
  - Age 0-4, 20%
  - Age 5-14, 60%
  - Age 15-19, 58%
- **Low-income children with a preventive dental visit in 2002**
  - Age 0-4, 9%
  - Age 5-14, 29%
  - Age 15-19, 18%



## Percentage of Children, Age 0-19, with any Dental Visit in the Past Year, by County, 2002

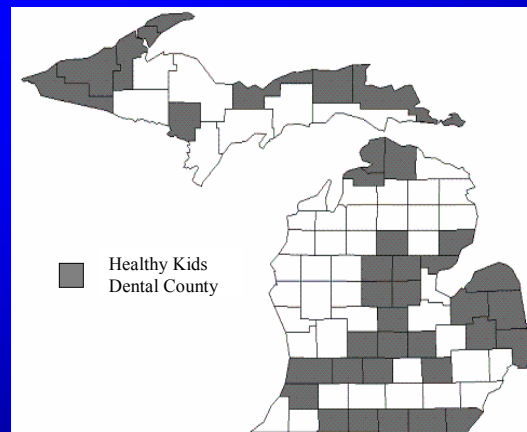


## Percentage of Medicaid-enrolled Children, Age 0-19, with a Preventive Dental Visit in the Past Year, 2002



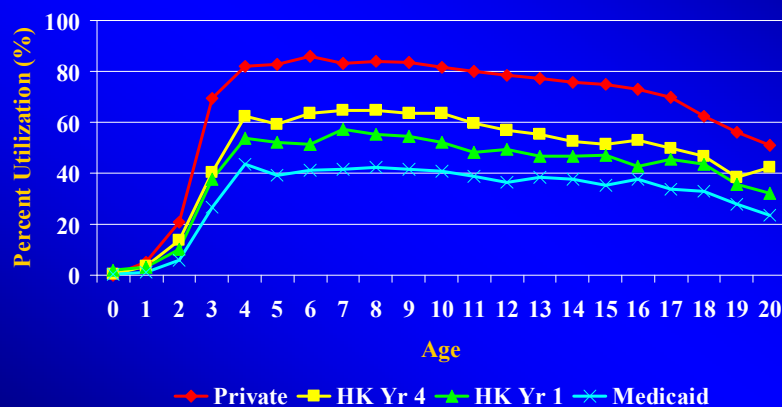


- Began in May 2000
- Currently covers Medicaid-eligible children in 37 counties
- Contracted to Delta Dental of Michigan
  - Reimbursement
  - Administration





## HKD Annual Utilization by Age, 12-Month Enrollment, Oct 2003 to Sept 2004



## Percentage of Adults who Visited the Dentist in the Previous 12 Months, BRFSS 2002

	Michigan (%)	United States (%)
HP2010 Target	56%	56%
Total	76%	69%
By Race		
Black non-Hispanic	65%	66%
White non-Hispanic	79%	72%
By Sex		
Female	77%	72%
Male	75%	68%



## Percentage of Adults who had their Teeth Cleaned within the Past Year, BRFSS 2002

	<b>Michigan</b> (%)	<b>United States</b> (%)
<b>Total</b>	76%	69%
<b>By Race</b>		
Black non-Hispanic	66%	62%
White non-Hispanic	79%	72%
<b>By Sex</b>		
Female	78%	72%
Male	75%	67%



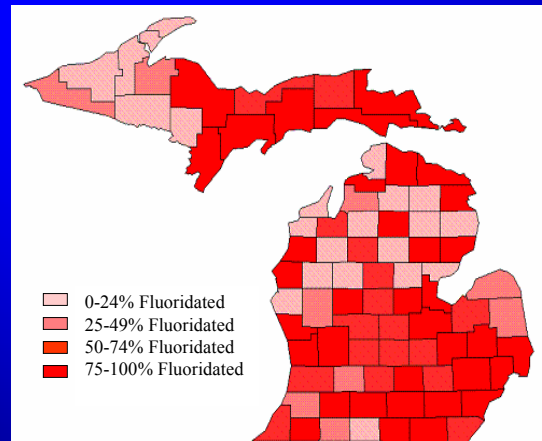
## Community Water Fluoridation

- **Healthy People 2010 Objective 21-9**
  - “Increase the proportion of the US population served by community water systems with optimally fluoridated water to 75%”
- **Every \$1 invested averts \$38 in costs (Griffin, 2001)**
- **Michigan community water fluoridation**
  - 73% of population served by community water supplies
  - 87% of the community water supply population receives adequately fluoridated water





## Percentage of Community Water Supply Population with Fluoridated Water, by County, 2004



\*Department of Environmental Quality

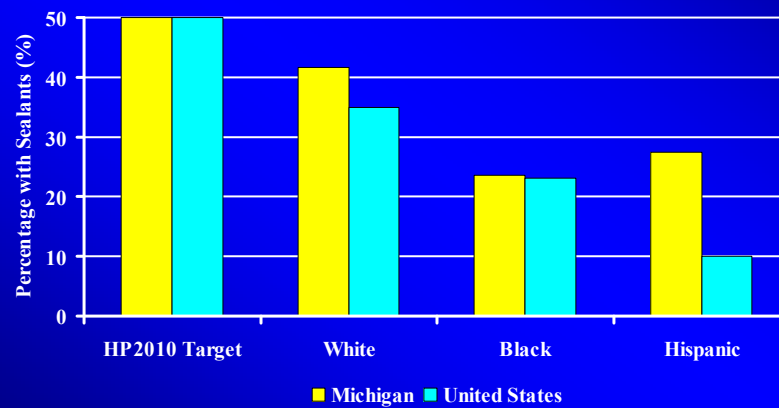


## Dental Sealants

- Prevents pit & fissure caries
- Healthy People 2010 Objective 21-8:a-b
  - “Increase the proportion of children who have received dental sealants on their molar teeth”
  - Goal, 1<sup>st</sup> molars at age 8, 50%
  - Goal, 2<sup>nd</sup> molars at age 14, 50%



## Percentage of Michigan and US Children, Age 8-9, with Sealants Applied to First Molars

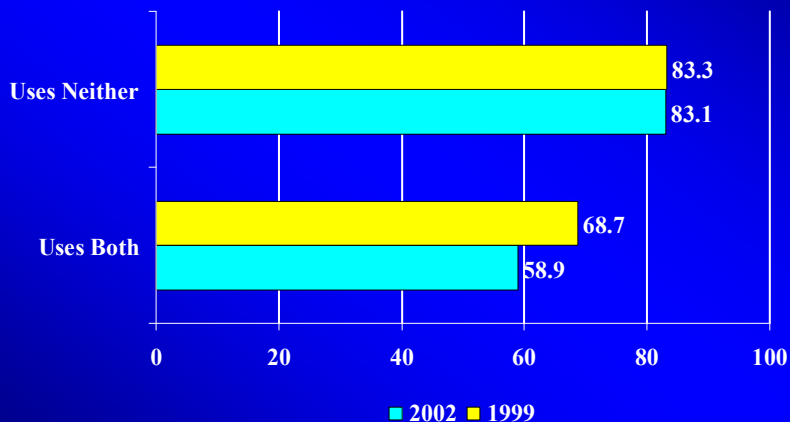


## Oral Cancer Screening

- **Healthy People 2010 Objective 21-7**
  - “Increase the proportion of adults who, in the past 12 months, report having had an examination to detect oral and pharyngeal cancers.”
- **Risk factors**
  - Modifiable risk factors include tobacco and alcohol use
  - Oral cancer is more prevalent in males and African Americans
  - 90% of oral cancers occur in persons age 45 and older



### Percentage of Adults age 40+ with a Dental Visit in the Past Year, by Excessive Alcohol Use & Current Smoking Status, BRFSS 1999, 2002

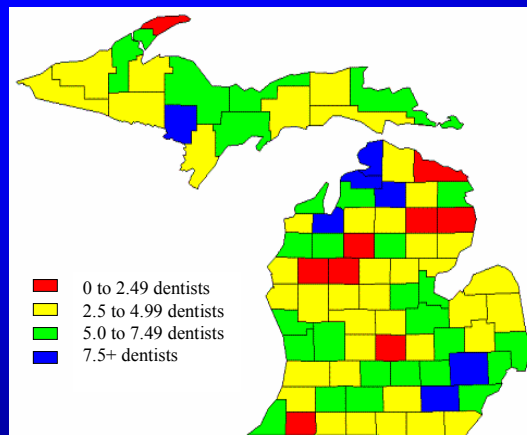


### Oral Health Workforce in 2004

- **Dentists**
  - 6444 of 7598 licensed dentists had a Michigan address
  - 1933 (30.0%) were enrolled to receive Medicaid
  - 1592 (24.7%) had at least one Medicaid claim
  - 552 (8.6%) qualified as critical access providers (Medicaid claims totaling > \$10,000)
  - 11 of 83 counties had less than 5 dentists
- **Dental Hygienists**
  - 8279 of 9275 licensed dental hygienists had a current Michigan address



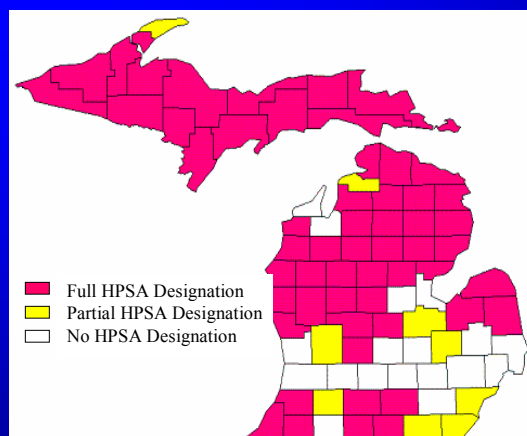
## Licensed Dentists with a Current Michigan Address (per 10,000) by County, 2004



\*Bureau of Licensing & Health Professions



## Health Provider Shortage Area Designations for Dental Care, by County, 2004





## Dental Education & Diversity

- Institutions
  - 2 dental schools with 182 first year pre-doctoral dental students in 2002-03
  - 12 dental hygiene programs with 346 first year dental hygiene students in 2002-03
  - 6 dental assisting programs with 199 first year dental assistant students in 2002-03
- Racial diversity of providers, nationally in 1997
  - 1.9% Black
  - 2.7% Hispanic



## Dental Insurance in Michigan

- 2003 Dental Insurance Validation Survey in Michigan (Assessed those under 21)
  - 84.4% of persons age 20 and under had dental coverage
  - 57.3% Employer, 24.4% Medicaid
  - Half of persons age 18-19 had breaks in coverage
  - 9.0% reported cost as a barrier to dental care



## Summary of Disease

- Adult tooth loss continues to decline in Michigan, however residents in the city of Detroit have a significantly higher burden
- Oral cancer is disproportionately a higher burden in the Detroit area and is more frequent among males and Blacks
- Hispanic populations appear to be at increased risk for ECC in Michigan



## Summary of Prevention

- Community water fluoridation is widespread but some areas are underserved
- Dental sealants need to be increased among all races, but particularly Blacks and Hispanics
- Need for improved oral cancer screening and early detection of oral cancer
- Need for increased use of dental preventive services by low-income individuals



## Summary of Infrastructure

- Health Kids Dental has helped improve access to low-income individuals
- Mal-distribution of dentists
- Lack of diversity in the dental workforce



## References

- American Dental Association. *Survey of Allied Dental Education, 2002-03*. Chicago, IL: American Dental Association Survey Center, 2004.
- American Dental Association. *Survey of Predoctoral Dental Education, 2002-03, Vol 1*. Chicago, IL: American Dental Association Survey Center, 2004.
- Centers for Disease Control and Prevention (CDC). National Center for Health Statistics, State and Local Area Integrated Telephone Survey, *National Survey of Children's Health, 2003*.
- Centers for Disease Control and Prevention (CDC). *Behavioral Risk Factor Surveillance System Survey Data, Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 1996*.
- Centers for Disease Control and Prevention (CDC). *Behavioral Risk Factor Surveillance System Survey Data, Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 1999*.
- Centers for Disease Control and Prevention (CDC). *Behavioral Risk Factor Surveillance System Survey Data, Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2002*.
- Centers for Disease Control and Prevention (CDC). National Center for Health Statistics, State and Local Area Integrated Telephone Survey, *National Survey of Children with Special Health Care Needs, 2001*.
- Centers for Medicare and Medicaid Services. National Health Expenditure (NHE) amounts by type of expenditure and source of funds: calendar years 1965-2013. Updated October 2004.
- Griffin SO, Jones K, Tomar SL. An economic evaluation of community water fluoridation. *J Public Health Dent* 2001;61(2):78-86.
- Hembroff, L. The Michigan Child Dental Coverage Validation Survey, 2003. August 2003.
- Ismail, A. Epidemiology of Oral Cancer in Michigan. Michigan Oral Cancer Prevention Network. May 2003.
- US Dept of HHS. Oral Health. In: Healthy People 2010 (2<sup>nd</sup> ed). With Understanding and Improving Health and Objectives for Improving Health. 2 vols. Washington DC: US Government Printing Office; 2000b.



Thank You